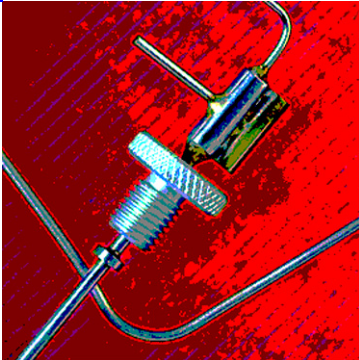
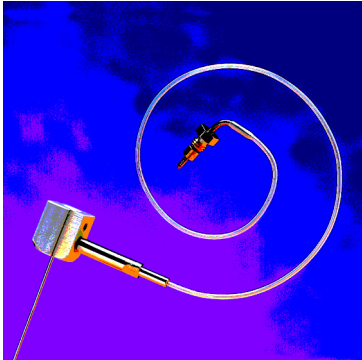


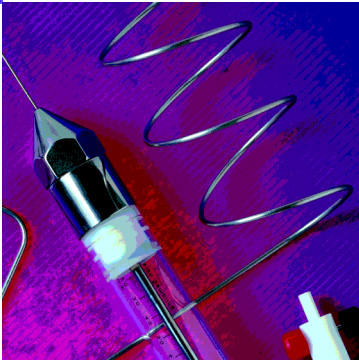
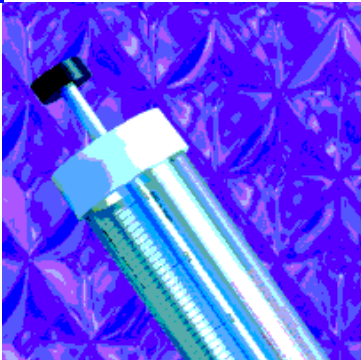
VICI®

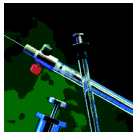


Precision Sampling Catalog



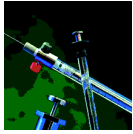
**Syringes
for
Chromatography**





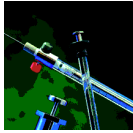
Syringe Features

2-5



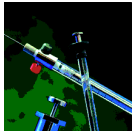
Gas/Liquid Syringes

6-14



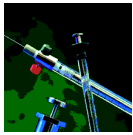
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Autosampler and OEM Syringes

24-25



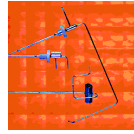
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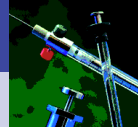
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TRADEMARKS

Cheminert	Valco Instruments Co. Inc. and VICI AG
Hamilton	Hamilton
Hastelloy C	Haynes International
Micro-Flo	Valco Instruments Co. Inc.
Microlab	Hamilton
Mininert	Valco Instruments Co. Inc.
PEEK	Victrex
Perkin Elmer	Perkin Elmer Inc.
Pressure-Flo	Valco Instruments Co. Inc.
Pressure-Lok	Valco Instruments Co. Inc.
Rheodyne	Rheodyne
Ryton	Phillips Petroleum Co.
Varian	Varian Associates
VICI	Valco Instruments Co. Inc. and VICI AG
Waters	Waters Associates



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<i>Pressurized sample storage with built-in push-button valve</i>	
Series C	8
<i>With optional Chaney adapter</i>	
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<i>Without built-in valve</i>	
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<i>Reinforced plunger to prevent bending</i>	
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<i>For small volume (1 - 10 µl) injections</i>	
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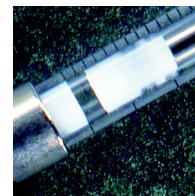
SUPPORT

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Pressure-Lok® Syringe Features

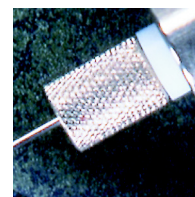
PTFE Plunger Tip

Plunger tips are fabricated of PTFE, stress-formed by our own special process to insure a leak-tight seal. The self-lubricating plunger tip stays smooth for the life of the syringe, with none of the freezing up or residue build-up associated with conventional all-metal plungers.



PTFE-Sealed Needle

Standard needle attachment includes a barrier sleeve or packing of PTFE on the rear of the needle at the zero point. This isolates the sample from the needle cement, preventing possible dissolution of the adhesive or contamination of the sample. Many models are also available in a luer-tip version.



Ultra-Smooth Bore

Syringe barrels up to 100 μ l are hand-fabricated from high quality borosilicate glass, manufactured to our specifications. The extremely smooth bore prevents undue wear of the plunger tip and insures a smooth, durable seal.

Hand Calibration

Each barrel undergoes a series of quality checks, including hand-calibration of consistent volume delivery. After final assembly of each lot, volume delivery is checked again with an electronic microbalance. These careful steps in quality control insure that every Pressure-Lok® microsyringe measures up to today's stringent requirements for precision and accuracy.

Easily Replaceable Parts

Depending on the specific model, some or all of the wear parts can be easily replaced, optimizing your equipment investment.

Shaped Rear Flange

All syringes have a rear flange to provide a secure grip and keep the syringe from rolling.

Low Dead Volume

Every syringe design takes advantage of every opportunity to minimize or eliminate dead volume.

Crisp, Clean Graduations

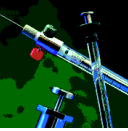
Our methods insure easy reading of the sampled amount.

PTFE

Polytetrafluoroethylene is the generic name for the class of materials such as Teflon® sold by E.I. duPont de Nemours.

SAFETY NOTE

To prevent possible injury, proper safety precautions should always be observed when pressurizing glass cylinders such as syringes.



Special Features of Select Models

Pressurized Sample Storage

Several of our syringes have a built-in valve to allow sample storage at up to 250 psi. This feature also allows pre-pressurization of the sample before injection so that the sample is flushed into the column instantaneously, providing better resolution. For conventional syringes, our Mininert syringe valve adds this capacity.

Removable Needles

Many models offer a special pressure-tight, low dead volume connection to facilitate easy removal and replacement of needles.

Optional Luer Tip for Convenience

Although our standard PTFE-sealed needle offers superior performance, we also offer the added convenience of luer-tip models.

Positive Rear Plunger Stop

If plunger damage from accidental plunger removal has been a problem, select one of our syringes with this feature.

Reinforced Plunger

If plunger-bending is a problem that contributes to excessive syringe repair bills in your lab, this feature offers a solution.

Side Vent

VICI Precision Sampling offers a unique model with a side vent, allowing easy syringe filling and cleaning.

Custom Products

At VICI Precision Sampling, we take great pride in being able to customize our products to fit your needs while maintaining our standards. Call us if you need custom length needles, special gauge needles, or custom syringes.

PRODUCTS WITH THESE FEATURES

Pressurized Sample Storage

Gas pages 6 -7, 10
High pressure 26-27

Removable Needles

Gas 6-10
Liquid 14, 16, 18

Optional Luer Tip

Gas 7 -10
Liquid 22

Positive Rear Plunger Stop

Gas 6-8, 10
Liquid 18, 19
High pressure 26-27

Reinforced Plunger

Liquid 16-19

Side Vent

Liquid 17

SAFETY NOTE

To prevent possible injury, proper safety precautions should always be observed when pressurizing glass cylinders such as syringes.

Syringe Features

VICI Precision Sampling syringes have all the standard features noted below at left, with special features delineated in the charts below.

Gas/Liquid Syringes

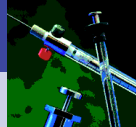
FEATURES	Pressure rating	Removable needle	Luer needle	Sample-Lok valve type	Plunger stop	Page
Series A	250 psi	■		twist-lock	■	6
Series A-2	250 psi	■	■	push-button	■	7
Series C	250 psi	■	■	*	■	8
Series D	250 psi	■	■	*		9
Magnum	30 psi	■	■	twist-lock	■	10

* Order a Mininert syringe valve on page 9.

SAMPLE SIZES	25 µl	50 µl	100 µl	250 µl	500 µl	1 ml	2 ml	5 ml	10 ml	20 ml	50 ml	100 ml	250 ml	500 ml
Series A			■	■	■	■	■	■	■					
Series A-2	■	■	■	■	■	■	■	■	■					
Series C			■	■	■	■	■	■	■					
Series D						■	■							
Magnum										■	■	■	■	■

PRESSURE-LOK® SYRINGE FEATURES

- PTFE plunger tip
- PTFE-sealed needle
- Ultra-smooth bore
- Hand calibration
- Easily replaceable parts
- Shaped rear flange
- Low dead volume
- Crisp, clean graduations



Liquid Syringes

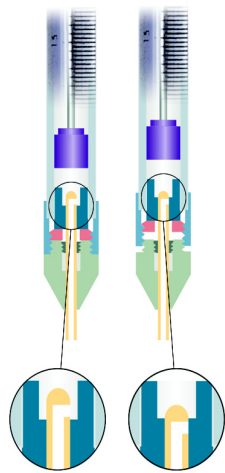
FEATURES	Pressure rating	Removable needle	Fixed needle	Reinforced plunger	Plunger stop	Side vent	Page
Series C-160	250 psi	■	■				14
Series C-120	250 psi		■				15
Series CG-130	250 psi	■	■	■			16
Series CGV-130	250 psi		■	■		■	17
Series D-140	30 psi	■		■	■		18
Mini injector			■	■	■		19
Purge and trap	250 psi	Luer lock					22

SAMPLE SIZES	.01 μ l	.10 μ l	1 μ l	2 μ l	5 μ l	10 μ l	25 μ l	50 μ l	100 μ l	5 ml	10 ml
Series C-160					■	■	■	■	■		
Series C-120					■	■	■	■	■		
Series CG-130					■	■					
Series CGV-130						■	■	■	■		
Series D-140			■	■	■	■					
Mini injector	■	■									
Purge and trap									■	■	

Series A Pressure-Lok®

SPECS

Removable needles
 Bevel, open end
 Removable needle size:
 .028" x .012" x 2"
 250 psi max,
 gases and liquids



Twist-Lock valve
 Open (left) and
 closed (right)

NOTE

Special replacement
 needles are available
 on request.

NEEDLE TIPS



Bevel, open end



Side port, taper

Further reference

Replacement
 components .. page 12



Series A, 250 µl
 #010031

Series A

- **Integral sample storage valve**
 Actuated by turning the nosepiece
- **Positive rear flange plunger stop**
 Prevents plunger from blowing out of barrel at elevated pressure
- **Modular construction**
 All components may be quickly disassembled for easy cleaning or replacement
- **Leak-tight to 250 psi**
 Liquids and gases

Turn the nosepiece counterclockwise two turns and the valve is closed. Insert the needle through the septum, then start pushing the plunger as you turn the nosepiece clockwise. Carrier backflushing is eliminated, resulting in sharper peaks and better separations. When the plunger is fully depressed, the plunger face comes into firm, flush contact with the bottom of the front packing, forcing essentially all of the sample out – there is virtually no compressible dead volume remaining. The very small internal diameter of the needle also contributes to the dead volume minimization.

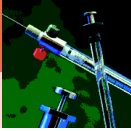
In addition to the characteristics which make it unique, the Series A gas syringe has all the standard Pressure-Lok® features such as a PTFE plunger tip, PTFE-sealed needle, and ultrasmooth bore.

Series A syringes

Sample size	Standard Prod No
100 µl	010025
250 µl	010031
500 µl	010032
1 ml	010033
2 ml	010034
5 ml	010035
10 ml	010036

Replacement needles

Package of 3:	Bevel, open end Prod No	Side port, taper Prod No
Standard Pressure-Lok® .029" x .012" x 2.25"	913050	913052



Series A-2

All the advantages of the Series A syringe plus:

- **Push-button valve**
Allows instantaneous injection
- **Smaller volumes**
Great for small volatile samples

The A-2 features a push-button valve, which allows sample storage to 250 psi in syringes as small as 25 µl. This is useful with small liquid samples containing low-boiling components which would be lost through evaporation using ordinary syringes.

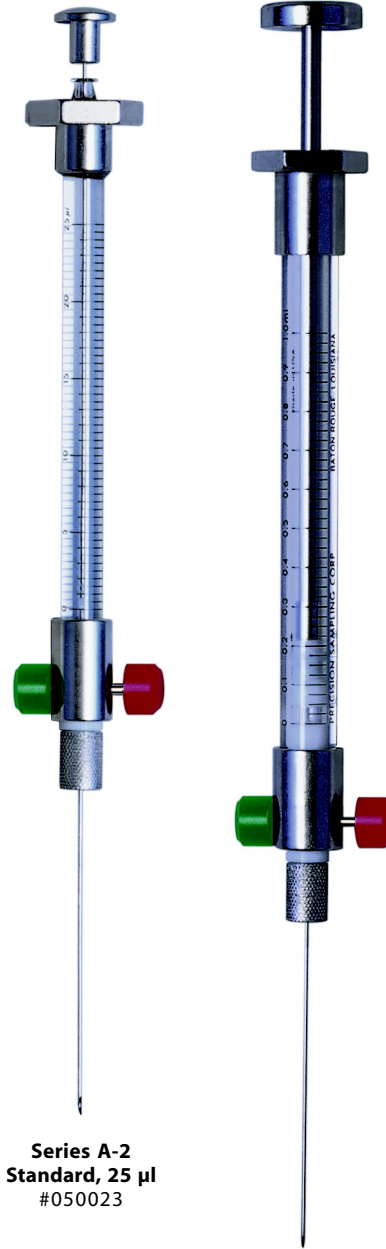
The positive rear stop (in 250 µl and larger sizes) prevents plunger blowout at elevated pressures, protecting against sample loss or operator injury. Like the Series A gas syringe, the A-2 has all the standard Pressure-Lok® features such as a PTFE plunger tip, PTFE-sealed needle, and ultrasmooth bore. Replacement components are available for easy repair.

Series A-2 syringes

Sample size	Standard	Luer
	Prod No	Prod No
25 µl	050023	050043
50 µl	050024	050044
100 µl	050025	050045
250 µl	050031	050051
500 µl	050032	050052
1 ml	050033	050053
2 ml	050034	050054
5 ml	050035	050055
10 ml	050036	050056

Replacement needles

Package of 3:	Bevel, open end	Side port, taper
	Prod No	Prod No
Standard Pressure-Lok®		
.029" x .005" x 2"	943050	—
.029" x .012" x 2"	943051	943052
Luer		
.028" x .006" x 2"	943060	—
.028" x .012" x 2"	943061	943062



Series A-2 Standard, 25 µl #050023

Series A-2 Standard, 1 ml #050033

SPECS

Removable needles
Bevel, open end
Needle size:
.029" x .005" x 2"
(25, 50, and 100 µl)
.029" x .012" x 2"
(all other sample sizes)
250 psi max,
gases and liquids

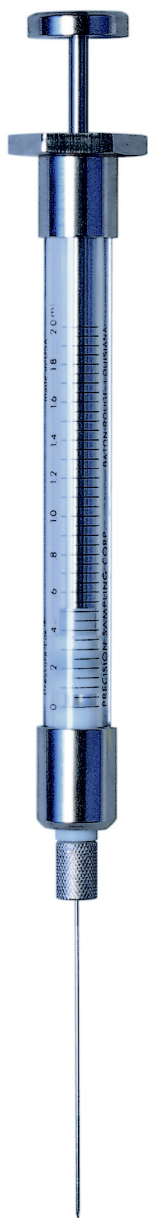
Further reference

Replacement components .. page 12

NEW hollow plunger syringe page 33

SPECS

Removable needles
 Bevel, open end
 Removable needle size:
 .029" x .005" x 2"
 .029" x .012" x 2"
 250 psi max,
 gases and liquids



**Series C,
 Standard needle
 2 ml
 #030034**

Series C

- **Optional Chaney adapter**
 Much lower dead volume than luer-style connectors
- **Perfect syringe for everyday use**
 All our standard features, but without a valve for pressurized sample storage

Series C syringes

Sample size	Standard	Standard	Luer
	Prod No	w/ Chaney adapter Prod No	Prod No
100 µl	030025	101430	030045
250 µl	030031	101440	030051
500 µl	030032	101448	030052
1 ml	030033	101455	030053
2 ml	030034	101463	030054
5 ml	030035	101470	030055
10 ml	030036	101478	030056

Replacement needles

Package of 3:	Bevel, open end	Side port, taper
	Prod No	Prod No
Standard Pressure-Lok®		
.029" x .005" x 2"	943050	-
.029" x .012" x 2"	943051	-
Chaney adapter		
.018" x .008" x .75"	-	101935

NEEDLE TIPS



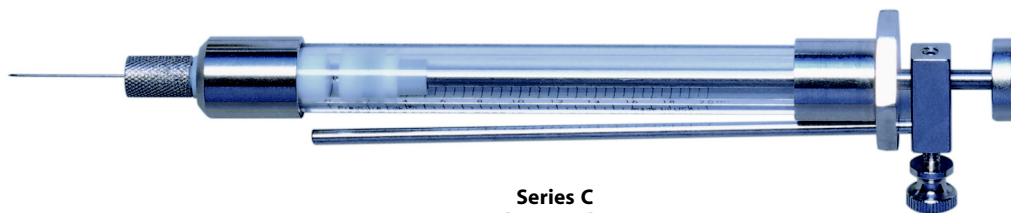
Bevel, open end



Side port, taper

Further reference

Replacement components .. page 12



**Series C
 w/ Chaney adapter
 2 ml
 #101463**



Series D

An economically priced high precision gas sampling syringe which offers more features than conventional gas-tight designs:

- Leak-tight, Pressure-Lok® plunger tip
- No dead volume barrel design
- Special low dead volume needle connector for accurate gas samples

Series D syringes

Sample size	Standard Prod No	Luer Prod No
1 ml	040033	040053
2 ml	040034	040054

Replacement needles

Package of 3:	Bevel, open end Prod No	Side port, taper Prod No
Standard Pressure-Lok® .029" x .012" x 2"	943051	943052
Luer .028" x .012" x 2"	943061	943062

Mininert Syringe Valves

For Series C and D syringes or conventional luer-tip syringes

- **Add sample storage capability**
Mount a Mininert syringe valve on a standard syringe
- **Push button operation**
Green to open, red to close

For a Series C or D syringe

These convenient add-on valves allow our Series C and D syringes to store samples at up to 250 psi. The valve body is all PTFE, with a stainless steel stem.

Prod No
654050



For a Luer-tip syringe

This model is identical to the valve above, except that it is designed to fit Luer-tip syringes from any manufacturer and accept traditional Luer needles.

Prod No
654051



SPECS

Removable needles
Bevel, open end
Needle size:
.029" x .012" x 2"
250 psi max,
gases and liquids



Series D
Standard, 1 ml
#040033

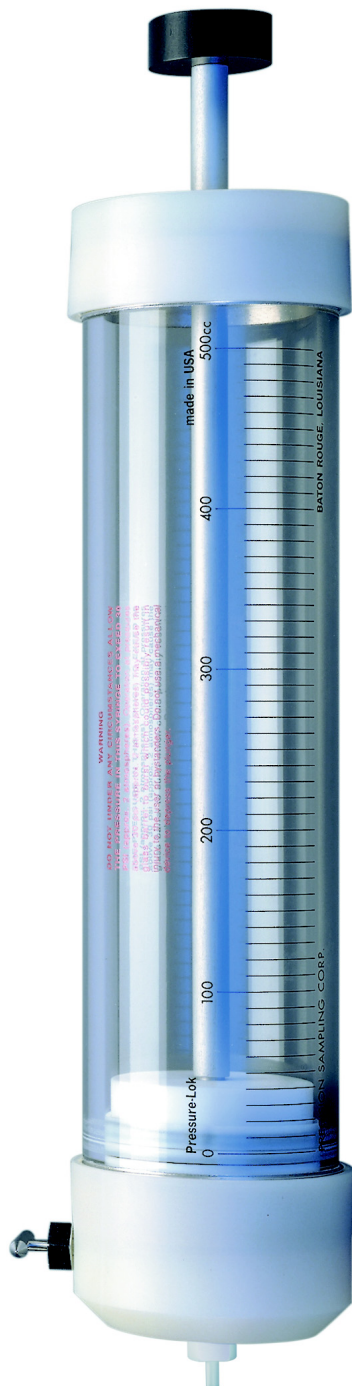
Further reference

Replacement
components .. page 12

Magnum Series

SPECS

Removable needles
Bevel, open end
Removable needle size:
.035" x .023" x 2"
30 psi max,
gases and liquids



**Magnum series
Standard, 500 ml
#060042**

Magnum Series

- **Built-in twist-lock valve**
Seals the sample (up to 30 psi) during transportation to the analysis site
- **Up to 500 ml capacity**
For sampling low concentration levels
- **Positive rear plunger stop**
Prevents plunger from blowing out when contents are pressurized

The detection of low levels of various environmental contaminants can require extraordinarily large samples. Magnum syringes facilitate the trapping of such samples in remote locations. A built-in valve allows the sample to be sealed within the syringe, maintaining sample integrity during transportation to the analysis site.

Magnums have been successfully used to sample atmospheric contaminants such as sulfur dioxide and oxides of nitrogen at distant points of the earth. The positive displacement capability of the durable PTFE plunger seal permits use in a variety of subsequent procedures involving extraction or concentration of trace components. (With a cryogenic enrichment apparatus, for example.)

The standard termination is a female threaded fitting (1/4-28), which accepts a variety of Cheminert® connectors or adapters. Specially formed seals permit leak-tight operation to 30 psi (~ 2 atmospheres). *Because of the obvious danger in overpressurizing any glass container, the internal pressure of a Magnum gas syringe should never exceed 2 atmospheres.*

Magnum syringes

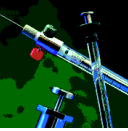
	Standard	Luer
<i>Sample size</i>	<i>Prod No</i>	<i>Prod No</i>
20 ml	060037	060043
50 ml	060039	060044
100 ml	060040	060045
250 ml	060041	060046
500 ml	060042	060047

Replacement needles

	Bevel, open end	Side port, taper
<i>Package of 3:</i>	<i>Prod No</i>	<i>Prod No</i>
Standard Pressure-Lok®		
.035" x .023" x 2"	953050	953052
Luer		
.035" x .023" x 2"	953061	953062

Further reference

Replacement components .. page 13



Replacement Needles for Gas/Liquid Syringes

Slip-on needles for Series A-2, C, and D syringes feature a needle extension through the hub that fits inside the PTFE tip on the syringe. This design eliminates the dead volume inherent in conventional hubbed needles.

Needles are manufactured to exacting tolerances from high precision stainless steel tube stock. The point styles and lengths listed below are standard, but we are willing to supply others. Let us know your requirements.

Replacement needles

Package of 3:		Bevel, open end	Side port, taper
Series		<i>Prod No</i>	<i>Prod No</i>
A	Standard Pressure-Lok®		
	.029" x .012" x 2.25"	913050	913052
A-2	Standard Pressure-Lok®		
	.029" x .005" x 2"	943050	–
	.029" x .012" x 2"	943051	943052
	Luer		
	.028" x .006" x 2"	943060	–
	.028" x .012" x 2"	943061	943062
C	Standard Pressure-Lok®		
	.029" x .005" x 2"	943050	–
	.029" x .012" x 2"	943051	–
	Chaney adapter		
	.018" x .008" x .75"	–	101935
D	Standard Pressure-Lok®		
	.029" x .012" x 2"	943051	943052
	Luer		
	.028" x .012" x 2"	943061	943062
Magnum	Standard Pressure-Lok®		
	.035" x .023" x 2"	953050	953052
	Luer		
	.035" x .023" x 2"	953061	953062

NEEDLE TIPS



Bevel, open end



Side port, taper

Replacement Components – Series A, A-2, C, and D

Plunger tips

Series:	A	A-2	C	D
<i>Sample size</i>	<i>Prod No</i>	<i>Prod No</i>	<i>Prod No</i>	<i>Prod No</i>
100 µl	100017	100017	100017	–
250 µl	100029	100029	100029	–
500 µl	013932	013932	013932	–
1 ml	013933	013933	013933	013933
2 ml	013934	013934	013934	013934
5 ml	013935	013935	013935	–
10 ml	013936	013936	013933	–

Front packing

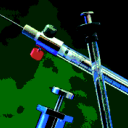
Series:	A
<i>Sample size</i>	<i>Prod No</i>
100 µl	100010
250 µl	100028
500 µl	100042
1 ml	100057
2 ml	100070
5 ml	100086
10 ml	100100

Plunger assemblies

Series:	A	A-2	C	D
<i>Sample size</i>	<i>Prod No</i>	<i>Prod No</i>	<i>Prod No</i>	<i>Prod No</i>
25 µl	–	054123	–	–
50 µl	–	054124	–	–
100 µl	014425	014425	014425	–
250 µl	014431	014431	014431	–
500 µl	014432	014432	014432	–
1 ml	014433	014433	014433	044433
2 ml	014434	014434	014434	044434
5 ml	014435	014435	014435	–
10 ml	014436	014436	014436	–

Further reference

Series A	page 6
Series A-2	7
Series C	8
Series D	9



Replacement Components – Magnum Series

Barrel assembly

<i>Sample size</i>	<i>Prod No</i>
20 ml	065637
50 ml	065639
100 ml	065640
250 ml	065641
500 ml	065642

Sleeve, front

<i>Sample size</i>	<i>Prod No</i>
20 ml	100288
50 ml	100312
100 ml	100333
250 ml	100352
500 ml	100372

Front packing

<i>Sample size</i>	<i>Prod No</i>
20 ml	065937
50 ml	065939
100 ml	065940
250 ml	065941
500 ml	065942

Sleeve, rear

<i>Sample size</i>	<i>Prod No</i>
20 ml	100289
50 ml	100313
100 ml	100334
250 ml	100353
500 ml	100373

Standard nosepiece

<i>Sample size</i>	<i>Prod No</i>
20 ml	065037
50 ml	065037
100 ml	065037
250 ml	065041
500 ml	065041

Stem cap

<i>Sample size</i>	<i>Prod No</i>
20 ml	100298
50 ml	100298
100 ml	100343
250 ml	100343
500 ml	100343

Luer nosepiece

<i>Sample size</i>	<i>Prod No</i>
20 ml	065042
50 ml	065042
100 ml	065042
250 ml	065043
500 ml	065043

Stem cap set screw

<i>Sample size</i>	<i>Prod No</i>
20 ml	500635
50 ml	500635
100 ml	500635
250 ml	500635
500 ml	500635

Plunger rod

Includes thumbpiece.

<i>Sample size</i>	<i>Prod No</i>
20 ml	065437
50 ml	065439
100 ml	065440
250 ml	065441
500 ml	065442

Valve stem

<i>Sample size</i>	<i>Prod No</i>
20 ml	100296
50 ml	100320
100 ml	100341
250 ml	100360
500 ml	100379

Plunger tip

<i>Sample size</i>	<i>Prod No</i>
20 ml	065537
50 ml	065539
100 ml	065540
250 ml	065541
500 ml	065542

Valve stem guide

<i>Sample size</i>	<i>Prod No</i>
20 ml	100297
50 ml	100321
100 ml	100342
250 ml	100361
500 ml	100361

Further reference

Magnum series, page 10

SPECS

Fixed and removable needles
 Bevel, open end
 Fixed needle size:
 .019" x .005" x 2"
 Removable needle size:
 .019" x .005" x 2.25"
 250 psi max,
 gases and liquids



Series C-160, 10 µl
#160022

Series C-160, 25 µl
#160223

Series C-160

- **PTFE needle seat at rear of needle**
Prevents possible dissolution of needle cement or contamination of the sample
- **Replaceable needles**
Complete with integral PTFE seal for a low dead volume connection and a leak-tight fit
- **Plunger tip of stress-formed virgin PTFE**
Self-lubricating and durable
- **Leak-tight to 250 psi**
Liquids and gases

The C-160 offers day-in, day-out dependability at an economical price. You also have the choice of fixed or removable needles.

Series C-160 syringes

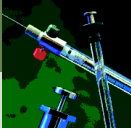
Sample size	Fixed needle	Removable needle
	Prod No	Prod No
5 µl	160021	160221
10 µl	160022	160222
25 µl	160023	160223
50 µl	160024	160224
100 µl	160025	160225

Replacement needles

Package of 3:	Bevel, open end
	Prod No
.019" x .005" x 2.25"	123050

Further reference

Replacement components .. page 23



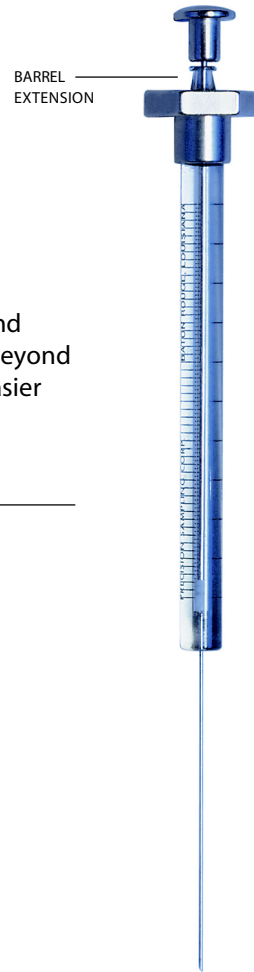
Series C-120

- **Fixed needle**
Zero dead volume connection
- **Leak-tight to 250 psi**
Liquids and gases
- **Extended syringe barrel**
Attach a bulb or suction line for easier cleaning and filling

In addition to standard Pressure-Lok® features such as PTFE plunger tip and needle seat, the C-120 offers as standard equipment a barrel extension beyond the rear flange which permits attachment of a vacuum bulb or line for easier filling or cleaning.

Series C-120 syringes

<i>Sample size</i>	Fixed needle
	<i>Prod No</i>
5 µl	120021
10 µl	120022
25 µl	120023
50 µl	120024
100 µl	120025



Series C-120, 100 µl
#120025

SPECS

Fixed needles
Bevel, open end
Needle size:
.019" x .005" x 2"
250 psi max,
gases and liquids

Further reference

Replacement
components .. page 23

SPECS

Fixed and removable needles
 Bevel, open end
 Fixed needle size:
 .019" x .005" x 2"
 Removable needle size:
 .019" x .005" x 2.25"
 250 psi max,
 gases and liquids



Series CG-130, 5 µl
 #130021

Series CG-130, 10 µl
 #130222

Series CG-130

- **Reinforced plunger**
 Eliminates plunger bending
- **Plunger guide in barrel**
 Smaller front section of plunger is confined within guide section
- **Replaceable needles**
 Low dead volume connection for a leak-tight fit
- **Leak-tight to 250 psi**
 Liquids and gases

A heavy, reinforced plunger within an enlarged plunger guide section of the CG-130 barrel virtually eliminates plunger bending. The smaller front section of the plunger is confined within the guide section even when the plunger is retracted, while the sturdy upper section absorbs the force of a rapid downstroke.

Series CG-130 syringes

Sample size	Fixed needle	Removable needle
	Prod No	Prod No
5 µl	130021	130221
10 µl	130022	130222

Replacement needles

Package of 3:	Bevel, open end
	Prod No
.019" x .005" x 2.25"	123050

Further reference

Replacement components .. page 23

Series CGV-130

- **Side vent**
For easy cleaning and filling
- **Reinforced plunger**
Eliminates plunger bending
- **Plunger guide in barrel**
Smaller front section of plunger is confined within guide section
- **Leak-tight to 250 psi**
Liquids and gases

The CGV-130 features the same rugged construction as the CG-130, with the addition of a side vent that can be used for filling or cleaning the syringe. A heavy, reinforced plunger within an enlarged plunger guide section of the barrel virtually eliminates plunger bending. The smaller front section of the plunger is confined within the guide section even when the plunger is retracted, while the sturdy upper section absorbs the force of a rapid downstroke.

Series CGV-130 syringes

Sample size	.005" ID needle	.008" ID needle
	Prod No	Prod No
10 µl	139022	-
25 µl	139023	-
50 µl	139024	139124
100 µl	139025	139125



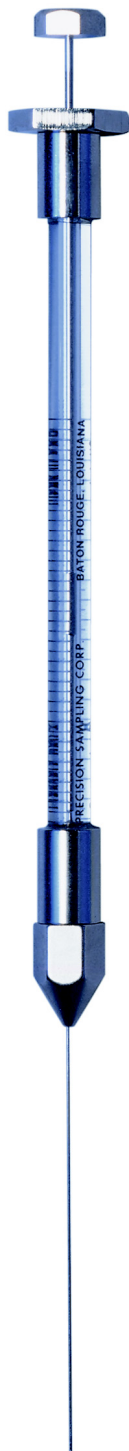
Series CGV-130
.005" ID needle
25 µl
#139023

SPECS

Fixed needles
Bevel, open end
Needle sizes:
.029" x .005" x 3.25"
.029" x .008" x 3.25"
250 psi max,
gases and liquids

SPECS

Removable needles
Size and style vary
with syringe size
30 psi max, liquids only



Series D-140
0 - 2 µl
#140012

Series D-140

- **Total sample displacement**
The entire sample is contained in the needle, so it is totally injected when the plunger is depressed
- **Positive rear plunger stop**
Eliminates accidental plunger removal and resultant damage
- **Modular construction**
All parts are replaceable, with easy assembly and disassembly

The Series D-140 is designed for small volume injection into gas chromatographs. Since the sample is totally contained within the needle, it is totally displaced by the plunger. Any residual sample or variation in sample size is minimized. (This also means that each size syringe has a different needle design. When ordering extra needles, be careful to specify the correct one.)

The PTFE seals, needle, plunger, and barrel are all replaceable. (Replacement parts are on page 23.) Thanks to superior alignment, the D-140 can be assembled time after time without difficulty or damage.

Series D-140 syringes

Sample size	Removable needle	
	Prod No	
1 µl	140011	
2 µl	140012	
5 µl	140021	
10 µl	140022	

Replacement needles

Package of 3.

Sample size		Blunt,	Bevel,	Side port,
		open end	open end	taper
		Prod No	Prod No	Prod No
1 µl	.019" x .005" x 2.5"	923011	-	-
2 µl	.019" x .008" x 2.5"	923012	-	-
5 µl	.028" x .012" x 2.5"	-	923021	-
10 µl	.028" x .018" x 2.5"	-	-	923022

NEEDLE TIPS



1 and 2 µl:
Blunt tip, open end



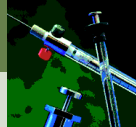
5 µl:
Bevel point, open end



10 µl:
Side port, taper

Further reference

Replacement components .. page 23



Mini Injector

- **Reproducible sample injections down to 0.01 μ l**

Without a splitter

- **Sample carried in the plunger itself**

The groove containing the sample is machined on the plunger, insuring repeatable results

The Mini Injector is ideal for capillary GC work, allowing reproducible injection of small samples (down to 0.01 μ l) without a splitter. This is possible through our unique use of a plunger-within-a-needle. The sample volume is carried in a precisely measurable groove ringing the wire plunger, with a durable PTFE packing to prevent leakage.

In use, the plunger is extended beyond the needle tip and dipped into the sample, where capillary action fills the groove. Then the plunger is drawn through a PTFE wiper and back into the needle for protection. When the needle is inserted into the inlet and the plunger is depressed, the sample carried on the plunger groove enters the heated zone, where it is flash-vaporized and swept into the column.

Mini injector

Sample size	Prod No
.01 μ l	170091
.10 μ l	170001

Replacement wiper

Sample size	Prod No
.01 μ l	100667
.10 μ l	100667

SPECS

Fixed needle
Bevel, open end
Needle size:
.028" x .019"



Mini injector
0.01 μ l
#170091

SPECS

Fixed and removable needles

Blunt tip, open end

Fixed needle size:

22 gauge x 2"

Removable needle size:

22 gauge x 2"

250 psi max,
gases and liquids

Syringes for Valco, Cheminert®, and Rheodyne® Valves



Syringes used to fill a loop on a sample injection valve have blunt smooth ends. The end of the needle must contact the bottom of the valve's fitting detail uniformly and seal on the outside of the tip to deliver sample with any repeatability. All VICI Precision Sampling syringes for valve injections have smooth, burr-free ends that fit the valve fitting details perfectly. The standard HPLC syringe is our basic C-160 with a 2" long 22 gauge needle.

Syringes

<i>Sample size</i>	Fixed needle <i>Prod No</i>	Removable needle <i>Prod No</i>
5 µl	160021R	160221R
10 µl	160022R	160222R
25 µl	160023R	160223R
50 µl	160024R	160224R
100 µl	160025R	160225R

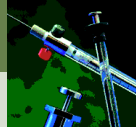
Replacement needles

Blunt tip, open end

<i>Package of 3:</i>	<i>Prod No</i>
22 gauge x 2"	123050R

Further reference

C-160 syringe ...page 14



Special Syringes for Rheodyne® Valves

Many Rheodyne valves allow the syringe needle to rub across the sealing surfaces – a tradeoff in a valve design which avoids having to machine small concentric holes. To prolong the lifetime of these valves, VICI Precision Sampling offers a syringe with a PEEK tip which extends beyond the end of the needle so that only PEEK contacts the valve sealing surfaces.

Syringes

Sample size	Fixed needle	Removable needle
	Prod No	Prod No
5 µl	160021RT	160221RT
10 µl	160022RT	160222RT
25 µl	160023RT	160223RT
50 µl	160024RT	160224RT
100 µl	160025RT	160225RT

Replacement needles

Blunt PEEK tip, open end

Package of 3:	Prod No
22 gauge x 2"	123050RT

Syringes for Cheminert Nanovolume Injector and Waters U6K Loop Injector

These injectors require a 26 gauge, 5 cm long needle with a 90° blunt tip and open end. We recommend mounting the needle on our basic C-160 syringe. (The C-160 is described on page 14.)

Syringes

Sample size	Fixed needle	Removable needle
	Prod No	Prod No
5 µl	160021WB	160221WB
10 µl	160022WB	160222WB
25 µl	160023WB	160223WB
50 µl	160024WB	160224WB
100 µl	160025WB	160225WB

Replacement needles

Bevel, open end

Package of 3:	Prod No
26 gauge x 5 cm	123050WB

SPECS

Fixed and removable needles
Blunt PEEK tip, open end
Fixed needle size:
22 gauge x 2"
Removable needle size:
22 gauge x 2"
250 psi max,
gases and liquids

SPECS

Fixed and removable needles
Blunt tip, open end
Fixed needle size:
26 gauge x 5 cm
Removable needle size:
26 gauge x 5 cm
250 psi max,
gases and liquids

Further reference

C-160 syringe ... page 14

SPECS

Accepts standard Luer hub needles



Purge and trap syringe
5 ml
#030039

Purge and Trap Syringe

- **Luer lock**
For use with purge and trap analysis
- **Frosted glass on syringe barrel**
Allows easy volume reading and accepts writing
- **Plunger tip of stress-formed virgin PTFE**
Self-lubricating and durable
- **Heavy duty rear flange**
Flat edges keep the syringe from rolling

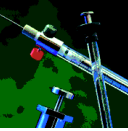
The heavy duty construction of our purge and trap syringe helps eliminate costs of replacement and injuries due to breakage. All of our environmental syringes are repairable.

Syringes

<i>Sample size</i>	<i>Prod No</i>
5 ml	030039
10 ml	030040

Syringes with push-button valve

<i>Sample size</i>	<i>Prod No</i>
5 ml	050039
10 ml	050040



Replacement Components – Liquid Syringes

Replacement needles

Package of 3:

Series		Blunt, open end <i>Prod No</i>	Bevel, open end <i>Prod No</i>	Side port, taper <i>Prod No</i>
C-160	.019" x .005" x 2.25"	–	123050	–
CG-130	.019" x .005" x 2.25"	–	123050	–
D-140	.019" x .005" x 2.5"	923011	–	–
	.019" x .008" x 2.5"	923012	–	–
	.028" x .012" x 2.5"	–	923021	–
	.028" x .018" x 2.5"	–	–	923022

Plunger assemblies

Sample size	Series C-160 <i>Prod No</i>	Series C-120 <i>Prod No</i>	Series CG-130 <i>Prod No</i>	Series D-140 <i>Prod No</i>
1 µl	–	–	–	143711
2 µl	–	–	–	143712
5 µl	163721	123721	133721	143721
10 µl	163722	123722	133722	143722
25 µl	163723	054123	–	–
50 µl	163724	054124	–	–
100 µl	163725	054125	–	–

Plunger Packings – D-140 series only

Sample Size	<i>Prod No</i>
1 µl	144011
2 µl	144012
5 µl	144021
10 µl	144022

NEEDLE TIPS



Blunt tip, open end



Bevel point, open end



Side port, taper

Further reference

Series C-120	page 15
Series C-160	14
Series CG-130	16
Series D-140	18



Autosampler Syringes

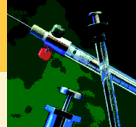
All our autosampler syringes conform to specifications supplied by the manufacturer.

Varian

We supply the syringes for the Varian GC 511, PTA30, PTA30WS, and Archon instruments.

<i>For</i>		<i>Prod No</i>	<i>Description</i>	<i>Needle Size</i>	<i>Ga.</i>
511	1.5 μ l	102103	Taper, blunt,	.028" x .008" x 2"	22
	5 μ l	102100	and open	.024" x .006" x 2"	23
	50 μ l	102102	end needle	.024" x .006" x 2"	23
PTA		030038	Luer		
PTA30WS		030038	fitting		
Dynatrap		030038			
Archon		502968	26 ml barrel with decal		

**Autosampler syringe
for 511-5 μ l
#102100**



Perkin Elmer

For	Size	Taper, blunt, & open end	
		Ga.	Prod No
5 µl GC Autosystem	.024" x .006" x 70 mm	23	102052
	.022" x .005" x 70 mm	24	101989



**Autosampler syringe for
5 µl GC Autosystem
#102052**

Central Instruments Co.

Replacement syringes and needles for models GC-311, GC-111, GC-411, and Perkin Elmer models AS100 and AS300.

Syringes	Standard	Viscous	Megabore
Sample size	Prod No	Prod No	Prod No
3 µl	500076	501071	503188
5 µl	500084	501072	-
10 µl	500090	501073	-



**Standard, 3 µl
#500076**

Needles	Standard	Viscous	Megabore
Sample size	Prod No	Prod No	Prod No
3 µl	500081	500994	502743
5 µl	500088	501040	-
10 µl	501064	501092	-



**Standard, 3 µl
#500081**

SPECS

Special integral calibrated plunger

Needle size:
22 gauge
500 psi max,
liquids only



Pressure-Flo, 0.5 µl
#220005

Pressure-Flo® Syringes

- **Seals at 500 psi**
Take high pressure samples from a cylinder or "bomb"
- **Sample contained in a calibrated needle**
Injects directly through the GC septum inlet
- **Use with cylinder adapter**
Lets syringe interface with gas cylinder

The Pressure-Flo high pressure syringe is a tried and true method of taking homogeneous high pressure samples from a cylinder or "bomb". It contains the sample in a calibrated needle with a wire plunger to displace it and PTFE packing to seal it in, permitting injection of the sample directly through the GC septum inlet for convenience and simplicity.

The body of the syringe is lightweight for easy handling. It houses a special crimped PTFE packing which seals firmly at pressures up to 500 psi even under severe operating conditions. Threads allow the syringe to make up on a cylinder via the special adapters listed below. Once the syringe is screwed tight, the cylinder valve is opened and the plunger is depressed, extending the needle into the liquid zone. Once sample is drawn into the syringe, it is stored pressure-tight while the cylinder valve is closed and the syringe is removed from the adapter.

To inject the sample, the nose of the syringe is pressed very firmly against the septum to form a pressure-tight seal. (This requires a minimum 1/8" hole in the septum cap.) As this is done, the pointed tip of the needle punctures the septum. When the large handle is pushed in, the needle containing the sample is inserted into the injection port without any loss of contents.

Pressure-Flo syringes

Sample size	Prod No
.5 µl	220005
1 µl	220011
2 µl	220012
5 µl	220021
10 µl	220022

Bomb adapters

Fitting (NPT)	Prod No
1/8" female	240040
1/4" female	240041
1/8" male	240042
1/4" male	240043



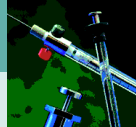
**Bomb adapter
1/4" male**
#240043



**Bomb adapter
1/4" female**
#240041

Further reference

Replacement components .. page 27



Micro-Flo® Syringes

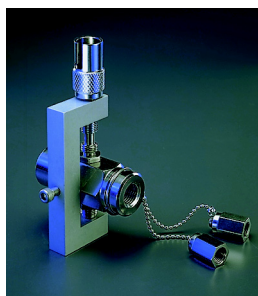
- **Metal-encased syringe with PTFE seals**
For hard-to-handle volatile liquids and liquified gases
- **Special locking cylinder adapter and yoke assembly**
The syringe contacts the sample liquid in its pure, undisturbed state
- **Sample Lok valve**
Seals in volatile materials at pressures up to 500 psi
- **Variable volume**
0.5 to 5.0 µl

The Micro-Flo high pressure syringe prevents evaporation of lighter components under normal laboratory temperatures at atmospheric pressure. The syringe is encased in metal, with positive PTFE seals and positive plunger stops. The front end houses a special micro-volume annular needle with less than .05 µl dead volume and a positive mechanical valve to seal in volatile materials (up to 500 psi).

Micro-Flo syringes

	<i>Prod No</i>
Syringe	230051
Adapter	230250

Micro-Flo adapter
#230250



Micro-Flo syringe
#230051

SPECS

Annular needle
Side port, tapered,
open end
Needle size:
.028" x .006" x 1.875"
500 psi max,
gases and liquids

Replacement Components for High Pressure Syringes

Pressure-Flo series

Sample size:	0.5 µl	1 µl	2 µl	5 µl	10 µl
	<i>Prod No</i>	<i>Prod No</i>	<i>Prod No</i>	<i>Prod No</i>	<i>Prod No</i>
Plunger assembly	220315	220311	220312	220321	220322

Sample size:	0.5 µl	1, 2, 5, and 10 µl
	<i>Prod No</i>	<i>Prod No</i>
Needles	220351	220352
Plunger packing	100800	220347
Front packing assy	220344	220344

Micro-Flo series

	<i>Prod No</i>
Needle	100838
Plunger assembly	100854
Front packing	100828
Barrel with decal	100827
Rear washer	100826
Spring	100830

Cylinder adapter and yoke assembly

	<i>Prod No</i>
Syringe side packing	100844
Plunger pin rod assembly	100846
Plunger pin side packing	100848

General Description

SPECS

TEMPERATURE

Mininert valves can be used at temperature up to 40°C. However, after use at high temperatures, the valve may leak slightly when cooled to room temperature.

PRESSURE

The sealing ability of Mininert valves is more than adequate to contain most volatile liquids and gases at low pressures. Mininert valves have been used as high as 120 psi without leakage, but this is NOT a recommendation for pressurizing glass containers to these levels. Such pressurization of glass containers can be extremely dangerous.

CHEMICAL RESISTANCE

PTFE is highly inert and may be used with most common materials. It is particularly useful for working with most acids and organic solvents. However, problems may be encountered when used with organometallics and some strong bases. We recommend actual exposure test before use with any material.

Mininert™ Valves

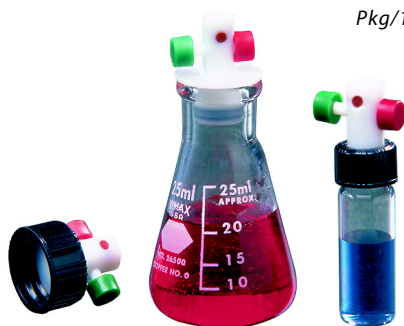
- **Leak-tight closure with syringe access**
Take a sample with no exposure of vial contents to the atmosphere
- **Models for virtually any laboratory glassware**
Screw-cap and crimp-top vials, test tubes, flasks, reaction chambers, 1/4-28 or pipe thread
- **Economical**
Save time and money through conservation of reagents, etc.
- **Replaceable septum**
Easily replaced with no exposure of contents to atmosphere
- **Simple installation**
No tools required

Mininert push-button valves are highly dependable, leak-tight closures for screw-cap vials and other laboratory containers. When used with a glass vial, only PTFE and glass are in contact with the contents. Their unique features make Mininert valves the ideal closure for calibration standards, air- or moisture-sensitive fluids, derivatizing reagents, volatile chemicals, etc.

Operation is extremely simple – push the green button to open the valve, insert the needle through the septum and take a sample, withdraw the needle, and push the red button to close the valve.

Valves for vials

The screw-cap Mininert is available in a variety of sizes. The crimp-top valve for 13 mm ID glassware slides into the neck of the vial and features a threaded flange which is turned to provide a leak-tight fit.



Pkg/12:	Cap / thread size	Prod No
	13 mm-425	614158
	15 mm-425	614160
	18 mm-400	614161
	20 mm-400	614170
	24 mm-400	614163
	Crimp top	614250



Valves with standard tapers

The laboratory taper model brings Mininert convenience and ease to a variety of applications using standard laboratory glassware, such as reaction chambers, test tubes, and other glass systems.

<i>Taper</i>	<i>Prod No</i>
14/20	621102
19/22	621103



Valves with threaded fittings

Our threaded designs offer positive on/off fluid control as an in-line valve or syringe access as a termination valve at a sample point. In-line valves are 1/4-28 male to male or 1/4-28 female to female. Termination valves are offered in 1/4-28 male or female and 1/8" NPT male or female.

In-line valves	<i>Prod No</i>
1/4-28 male to male	631205
1/4-28 female to female	631206

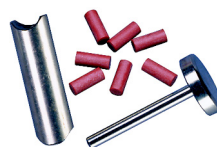
Termination valves	<i>Prod No</i>
1/4-28 male	631201
1/4-28 female	631203
1/8" NPT male	631202
1/8" NPT female	631204



Replacement septa and septum installation tool

These silicone septa fit all Mininert valves. The installation tool is a handy device for quickly removing and replacing needle seal septa.

	<i>Prod No</i>
Septa, <i>pkg/50</i>	644350
Installation tool	644850

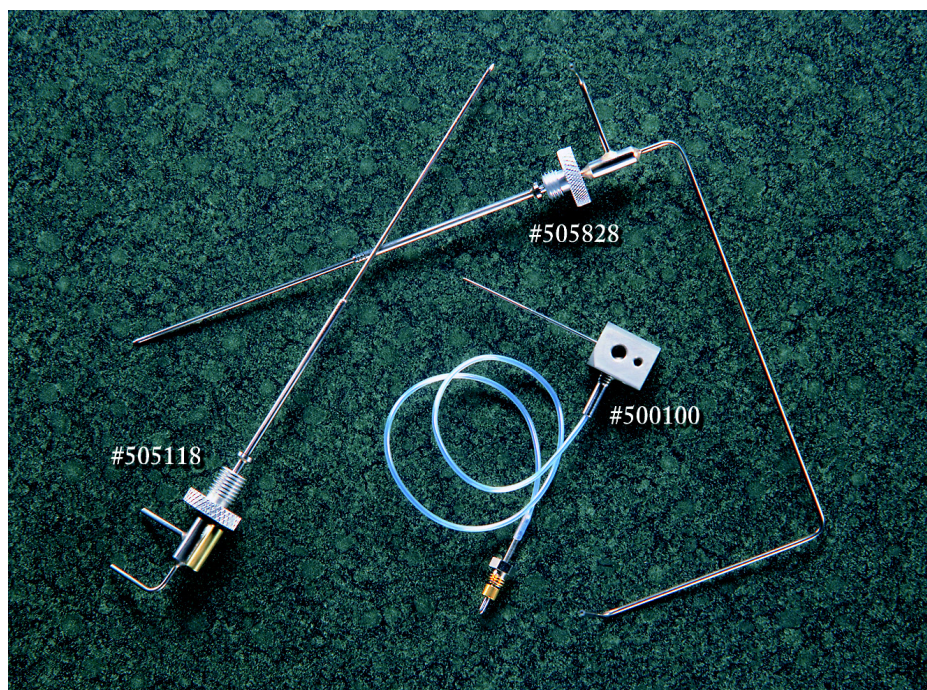


Mininert syringe valves

These convenient add-on valves allow our Series C and D syringes to store samples at up to 250 psi. The valve body is all PTFE, with a stainless steel stem. Also available to fit luer-tip syringes from any manufacturer.

	<i>Prod No</i>
For C or D syringe	654050
For Luer-tip syringe	654051





GC and LC Probes for Central Instruments Autosamplers

Probes are used to transfer liquid sample from a sample vial to the injection syringe by pressurizing the sample vial with helium.

GC probes

	<i>Prod No</i>
GC-111H	500031
GC-111V	500100
GC-311V	500100
GC-411V	500100
GC-311H	500441
Perkin-Elmer AS-300	500523

LC probes

	<i>Prod No</i>
LC-241 42 position	500335
LC-241 60 position	500301



PTA-30, WS, and DynaTrap Instruments

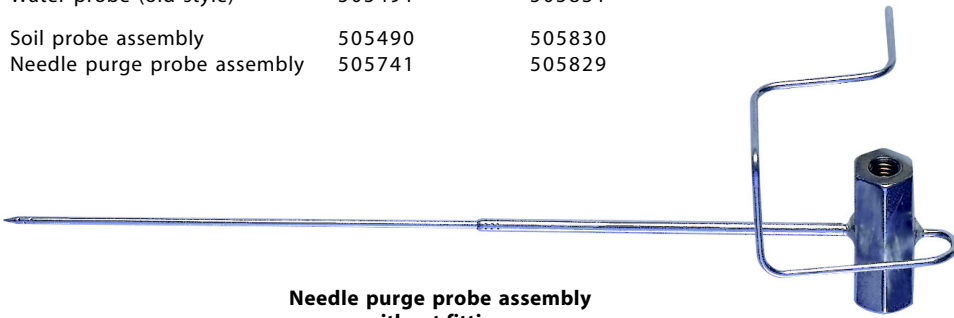
	<i>Prod No</i>	<i>Prod No</i>
Syringe probe assembly	502971	-
	With fittings	Without fittings
	<i>Prod No</i>	<i>Prod No</i>
Needle purge upper probe	505193	505118
Upper soil probe assembly	505032	503840



Syringe probe assembly
#502971

Varian Archon Instruments

	With fittings	Without fittings
	<i>Prod No</i>	<i>Prod No</i>
Water probe assembly	505739	505828
Water probe (old style)	505491	505831
Soil probe assembly	505490	505830
Needle purge probe assembly	505741	505829



Needle purge probe assembly
without fittings
#505829

SPECS

200 psi gas¹ /
500 psi liquid²
.060" bore
1/4-28 fitting detail
All polymer-based
materials

¹ Tested with Helium
using 1/16" OD x 0.84
mm ID PTFE tubing with
PEEK collapsible
ferrules

² Tested with
Isopropanol using
1/8" OD x 0.75 mm ID
PTFE tubing with CTFE
collapsible ferrules

NEW!

Micro Valves for GC and LC

- 200 psi gas, .060" bore
- Compact 1" design
- Convenient panel mount
- Variety of configurations

Simplify your liquid or gas handling application with a VICI Precision Sampling Micro valve. The unique design of the fitting detail allows a leak-free seal with no potential for rotor damage from overtightening. Internal parts are PEEK® and PTFE.



(Fittings not included)

Micro valves for GC and LC

1/4-28

	Prod No	3 PORT	4 PORT		
"T" flow path	3 ports			"T"	
	4 ports				660110
180° flow path	2 ports			180°	
	4 ports				660210
90° flow path	2 ports			90°	
	3 ports				660310
	4 ports				660320



NEW!

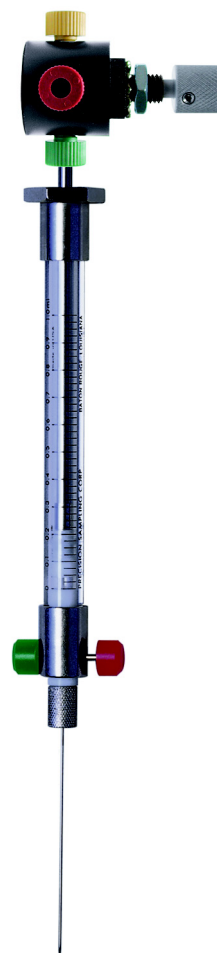
Hollow Plunger Syringe

- Hollow, flow-through plunger with integrated 3-way valve
- Push button on/off valve at the front end
- For liquids and gases

The new VICI Precision Sampling hollow plunger syringe (patent pending) with two integrated valves opens a whole new world of application possibilities:

- Dispense a viscous sample more easily by introducing it into the rear of the syringe instead of drawing it up through the needle.
- Eliminate sample-to-sample cross contamination by giving the syringe a thorough cleaning with a rinse introduced through the plunger.
- Sample continuously without ever withdrawing the needle from the original point of entry. Just close the on/off valve after drawing sample through the needle, and the sample is redirected out the plunger valve as the plunger is depressed.

Using this syringe typically involves less plunger manipulation than doing the same operation with a standard syringe, so you get the additional benefits of saved time and reduced plunger wear.



SPECS

Multivalve selection,
2-way, 3-way
Removable needles
200 psi max,
gases and liquids

Hollow plunger syringes

100 μ l - 250 μ l

	Prod No
100 μ l	020025
250 μ l	020031

Further reference

Replacement
needles page 7

NEW!

Syringes for Diluter/Dispensers and Automated Instrumentation

- Plunger with 6/32 UNC female thread
- Accepts male end fitting on Hamilton Microlab® diluters

This plunger style works for the most common diluter/dispenser and automated robotic instrumentation. The end fitting termination is without slots.



Instrumentation syringes

250 μ l - 1 ml

	Prod No
250 μ l	180031
500 μ l	180032
1 ml	180033

6/32 UNC
FEMALE THREAD



PTFE TIPPED
LUER LOCK TERMINATION



010025 page 6	054125 page 23	100800 page 27	160023 page 14
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010032 6	060039 10	100827 27	160023RT 21
010033 6	060040 10	100828 27	160023WB 21
010034 6	060041 10	100830 27	160024 14
010035 6	060042 10	100838 27	160024R 20
010036 6	060043 10	100844 27	160024RT 21
013932 12	060044 10	100846 27	160024WB 21
013933 12	060045 10	100848 27	160025 14
013934 12	060046 10	100854 27	160025R 20
013935 12	060047 10	101430 8	160025RT 21
013936 12	065037 13	101440 8	160025WB 21
014425 12	065041 13	101448 8	160221 14
014431 12	065042 13	101455 8	160221R 20
014432 12	065043 13	101463 8	160221RT 21
014433 12	065437 13	101470 8	160221WB 21
014434 12	065439 13	101478 8	160222 14
014435 12	065440 13	101935 8, 11	160222R 20
014436 12	065441 13	101989 25	160222RT 21
020025 33	065442 13	102052 25	160222WB 21
020031 33	065537 13	102100 24	160223 14
030025 8	065539 13	102102 24	160223R 20
030031 8	065540 13	102103 24	160223RT 21
030032 8	065541 13	120021 15	160223WB 21
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030034 8	065637 13	120023 15	160224R 20
030035 8	065639 13	120024 15	160224RT 21
030036 8	065640 13	120025 15	160224WB 21
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030040 22	065937 13	123050RT 21	160225RT 21
030045 8	065939 13	123050WB 21	160225WB 21
030051 8	065940 13	123721 23	163721 23
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500441	30		
500523	30		
500635	13		
500994	25		
501040	25		
501072	25		
501073	25		
501092	25		
502743	25		
502968	24		
502971	31		
503188	25		
503840	31		
505032	31		
505118	31		
505193	31		
505490	31		
505491	31		
505739	31		
505741	31		
505828	31		
505829	31		
505830	31		
505831	31		
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614160	28		
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614163	28		
614170	28		
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621103	29		
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943060	7, 11		

LENGTH CONVERSIONS

mm	inches
0.12	.005"
0.15	.006"
0.25	.010"
0.40	.016"
0.50	.020"
0.75	.030"
1.0	.040"
1.5	.060"
2.0	.080"
4.6	.180"
6.0	.236"
6.4	.253"
7.0	.276"
10.0	.400"
inches	mm
1/32"	0.8
1/16"	1.6
1/8"	3.2
1/4"	6.4
3/8"	9.5
1/2"	12.7
1"	25.4

PRESSURE CONVERSIONS

psi	KPa	BAR	Atm
1	6.8948	0.06895	0.06805
10	68.948	0.6895	0.6805
20	137.896	1.379	1.361
30	206.844	2.0685	2.0415
40	275.792	2.758	2.722
50	344.74	3.4475	3.4025
60	413.688	4.137	4.083
70	482.636	4.8265	4.7635
80	551.584	5.516	5.444
90	620.532	6.2055	6.1245
100	689.48	6.895	6.805
125	861.85	8.61875	8.50625
150	1034.22	10.3425	10.2075
175	1206.59	12.06625	11.90875
200	1378.96	13.79	13.61
225	1551.33	15.51375	15.31125
250	1723.7	17.2375	17.0125
275	1896.07	18.96125	18.71375
300	2068.44	20.685	20.415
325	2240.81	22.40875	22.11625
350	2413.18	24.1325	23.8175
375	2585.55	25.85625	25.51875
400	2757.92	27.58	27.22
425	2930.29	29.30375	28.92125
450	3102.66	31.0275	30.6225
475	3275.03	32.75125	32.32375
500	3447.4	34.475	34.025

GAUGE CONVERSIONS

Ga	mm	inches
14	2.108	0.083"
16	1.651	0.065"
18	1.270	0.050"
19	1.067	0.042"
20	0.889	0.035"
22	0.711	0.028"
23	0.635	0.025"
25	0.508	0.020"
26	0.457	0.018"

TEMPERATURE CONVERSIONS

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-40	-40	35	95	110	230	185	365	260	500	335	635	650	1202
-35	-31	40	104	115	239	190	374	265	509	340	644	675	1247
-30	-22	45	113	120	248	195	383	270	518	345	653	700	1292
-25	-13	50	122	125	257	200	392	275	527	350	662	725	1337
-20	-4	55	131	130	266	205	401	280	536	375	707	750	1382
-15	5	60	140	135	275	210	410	285	545	400	752	775	1427
-10	14	65	149	140	284	215	419	290	554	425	797	800	1472
-5	23	70	158	145	293	220	428	295	563	450	842	825	1517
0	32	75	167	150	302	225	437	300	572	475	887	850	1562
5	41	80	176	155	311	230	446	305	581	500	932	875	1607
10	50	85	185	160	320	235	455	310	590	525	977	900	1652
15	59	90	194	165	329	240	464	315	599	550	1022	925	1697
20	68	95	203	170	338	245	473	320	608	575	1067	950	1742
25	77	100	212	175	347	250	482	325	617	600	1112	975	1787
30	86	105	221	180	356	255	491	330	626	625	1157	1000	1832

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No returns will be accepted more than 90 days after shipment for any reason. Before 90 days, no returns will be accepted without prior authorization. If it is necessary to return material to us, please contact our Sales Department for a return authorization number and forwarding instructions. Inspect shipments upon receipt and report shortages or incorrect or damaged material to us immediately.

Important!

Damaged shipments must remain with the original packaging for freight company inspection.

Returned material will be subject to a minimum restocking fee of 10% for stock items and 20% for valves. Special orders cannot be returned unless defective.

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Our terms are net 30 days (prepayment for new customers). EXW shipping our factory Schenkon, Switzerland.

Prices are subject to change without notice.

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